

Order ID 50797

July 22, 2009 2:56:16 PM



Page 1

Item ID: D212-664-207

Accept



Setup Start



Revision ID: A

Stop



Item Name: -- Crosstube Low Standard Aft

Start Date: 07/22/2009 Start Qty: 1.00



Cust Item ID:

Required Date: 07/31/2009 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: *MF*

Date: 09-07-22 Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Draw Number	Draw Rev.	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	----------------	--------------	--------------	---------------	---------------	------------------	----------------

Draw Nbr

Revision Nbr

D212-664-247

Rev A

100

0.00



DOCUMENT CONTROL

DC

Memo

Photocopy bluefile and create labels as per PPP D212-664-207 CHG001

Document Control

110

0.00



Packaging

Packaging

Memo

Packaging

120

0.00



BENDING MACHINE - CROSSTUBES

CNC Bend 2

Memo

0.00

CNC Alpha 160 Bender

Bend tube as per Dwg D212-664-247 using CNC bender program and Folio FT

DP 9-7-24

9/8/7 *SY*

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

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Page 2

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Start Date: 07/22/2009 Start Qty: 1.00

Required Date: 07/31/2009 Req'd Qty: 1.00

Reference:

Accept

Setup Start

Stop

Cust Item ID:

Customer:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start

Stop

QC:

Date:

SPC (Y/N):

Date:

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run HoursDraw
NumberDraw
Rev.Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

130

QC15- Crosstube Dimensional Check

0.00

=> 507/4/24

QC

Memo

0.00

Quality Control

140

Crosstubes

0.00

Crosstubes

Crosstubes

Memo

0.00

1-Drill Rivet holes as per Dwg D212-664-247 using DT8972. 12-Drill pilot holes in tube as per Dwg D212-664-247 using DT8550 and DT8551. 13-Ream hole to finish size in tube as per Dwg D212-664-247. 14-Deburr & Inspect for surface damage. Repair damage within 1

150

Crosstubes Chemical Conversion

0.00

HandFXtube

Memo

0.00

Hand Finishing Crosstubes

Chemical Conversion Coat Tube & Cuffs

DP9-7-28

1 - Ø - ACUM9-7-29

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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Start Date: 07/22/2009 Start Qty: 1.00



Cust Item ID:

Required Date: 07/31/2009 Req'd Qty: 1.00



Customer:

Reference:

Run Start



Approvals:

Process Plan:

Date:

Tooling:

Date:

Stop



QC:

Date:

SPC (Y/N):

Date:

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run HoursDraw
NumberDraw
Rev.Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

160

QC3- Inspect Part Finish

0.00



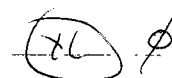
QC

Memo

0.00

Quality Control

⇒ 809/07/30



170

QC5- Inspect part completeness to step on W/O

0.00



QC

Memo

0.00

Quality Control

⇒ 809/02/30

8 weeks
notes

180

Outsource process - NDT per QSI038 4.1

0.00



Outsource2

Memo

0.00

Outsource process - NDT

Liquid Penetrant Inspection as per QSI 038 Issue P/O: 10/69 LPI as per
ASTM 1417 Level 2 Attach copy of NDT results to work order

CL 09/08/05 ①

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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Work Order ID 50797

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Required Date: 07/31/2009 Req'd Qty: 1.00

Cust Item ID:

Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start




QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Draw Number	Draw Rev.	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
190 	Packaging	0.00							
Packaging	Memo	0.00							
Packaging	Ensure copy of NDT results attached to work order.								
200 	QC5- Inspect part completeness to step on W/O	0.00							
QC	Memo	0.00							
Quality Control	Inspect for damage & ensure results are as per Dwg D412-664-203								
210 	Crosstubes	0.00							
Crosstubes	Memo	0.00							
Crosstubes	I-Rivet Cuffs as per Dwg D212-664-247. with Sika flex in Between tube & Cuffi :A/R SIKAFLEX -241/-291 BATCH: <u>111557</u>								

CY 09/08/05 ①

=> m/ 09 08 05 ①

m/ 09 08 05 ①

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
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Start Date: 07/22/2009 Start Qty: 1.00



Cust Item ID:

Required Date: 07/31/2009 Req'd Qty: 1.00



Customer:

Reference:

Run Start



Approvals: Process Plan:

Date:

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run HoursDraw
NumberDraw
Rev.Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

220

0.00



SprayPaint

0.00

SprayPaint

Memo

1-Prime inside and outside crosstube as per QSI 005 4.2 2-Paint outside
crosstube with White Imron as per QSI 005 4.2 ☐ PRIME: ☐ Start
Time: 10:00 ☐ Finish Time: 11:00 ☐ PAINT: ☐ Start
Time: 3:00 ☐ Finish Time: 4:00

⇒ ml 09 08 05 ①

Spray Painting

230

0.00



QC14- Inspect Spray Paint

0.00

QC

Memo

Wrap in plastic bag to protect from scratches

Quality Control



240

0.00



Crosstubes

0.00

Crosstubes

Memo

1- Assemble as per Dwg D212-664-247; 2- Lightly scuff the bonded area using
a 320 grit sand paper and clean the area with 41058 wash 'n' wipe 3- Instal
support with magnobond 6398 per dwg D212-664-247; 4- cure for 12hrs before
packaging. ☐ Time & date of appli

⇒ ml 09 08 06 ①

Crosstubes

09 08 06 / 9:00
B# 111249
exp: 02/2010

Torque: ml 09 08 07 ①

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
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Item ID: D212-664-207

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Start Date: 07/22/2009 Start Qty: 1.00

Required Date: 07/31/2009 Req'd Qty: 1.00

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Run Start

Stop

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Draw
Number

Draw
Rev.

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

250

QC5- Inspect part completeness to step on W/O

0.00

=> S o r l o s l o 7

(H) 0

QC

Memo

0.00

Quality Control

260

QC4- 100% Inspect kits for completeness

0.00

2) S o r l o s l o 7

(H) 0

QC

Memo

0.00

Quality Control

270

Packaging

0.00

Per A

9/8/7

(H) 0

Packaging

Memo

0.00

Packaging

Identify and pack for shipping as per PPP D212-664-207

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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Work Order ID 50797

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Item ID: D212-664-207

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Stop

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Start Date: 07/22/2009 Start Qty: 1.00

Cust Item ID:

Required Date: 07/31/2009 Req'd Qty: 1.00

Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start

QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Draw
Number

Draw
Rev.

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

280

QC21- Final Inspection - Work Order Release

0.00



QC

Memo

0.00

Quality Control

07-08-09
ls

C209108107

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Picklist Print

July 22, 2009 2:56:16 PM

Work Order ID: 50797

Parent Item: D212-664-207RevA

Parent Item Name: Crosstube Low Standard Aft



Comments:

Start Date: 07/22/2009

Required Date: 07/31/2009

Start Qty: 1.00

Required Qty: 1.00

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Remaining Qty To Pick	Qty Issued	Date Issued	Status
D3428-1RevA		Manufactured	No			100260	Each	18.0000	1.0000			
												
Placard												

Warehouse Loc Qty Loc Code
Location

Main Warehouse

ST 18
47310 8
48359 10

47310

SP
9/8/7

D212-664-207TRNRevA Manufactured No

140 Each 0.0000 1.0000



Crosstube Turning Detail

D3660-1RevB Manufactured No

220 Each 10.0000 2.0000



CUFF

Warehouse Loc Qty Loc Code
Location

Main Warehouse

ST 10
44455 4
46705 6

2- AWM 9-7-27

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

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NOTE: Date & initial all entries

Picklist Print

July 22, 2009 2:56:16 PM

Page 2

Work Order ID: 50797

Parent Item: D212-664-207RevA

Parent Item Name: Crosstube Low Standard Aft


Comments:

Start Date: 07/22/2009

Required Date: 07/31/2009

Start Qty: 1.00

Required Qty: 1.00

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Remaining Qty To Pick	Qty Issued	Date Issued	Status
CR3212-4-06		Purchased	No			240	Each	346.0000	44.0000			
												
CHERRY RIVET												

Warehouse Loc Qty Loc Code
Location

Main Warehouse

ST

346

107534

346

D2940-1RevB

Manufactured

No

240

Each

74.0000

2.0000



Support

ml 09 08 05

Warehouse Loc Qty Loc Code
Location

Main Warehouse

ST

74

24367

4

25594

2

41536

10

41870

20

45203

18

47748

20

ml ml 09 08 06

July 22, 2009 2:56:16 PM

Shop Packet Print

Page 2

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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Picklist Print

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Page 3

Work Order ID: 50797

Parent Item: D212-664-207RevA

Parent Item Name: Crosstube Low Standard Aft


Comments:

Start Date: 07/22/2009

Required Date: 07/31/2009

Start Qty: 1.00

Required Qty: 1.00

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Remaining Qty To Pick	Qty Issued	Date Issued	Status
D3595-063-530RevA		Manufactured	No			240	Each	162.0000	4.0000			
												
RUBBER CUSHION												

Warehouse Loc Qty Loc Code

Location

Main Warehouse

ST 162

40780 2

44998 48

50030 112

ml ml 0A 08 06

AN6-40A

Purchased

No

260

Each

31.0000

4.0000

Bolt

Warehouse Loc Qty Loc Code

Location

Main Warehouse

ST 31

111424 31

111424 SL

AN6-41A

Purchased

No

260

Each

67.0000

2.0000

Bolt

Warehouse Loc Qty Loc Code

Location

Main Warehouse

ST 67

109371 17

111605 50

109371 9/8/09 SL

July 22, 2009 2:56:16 PM

Shop Packet Print

Page 3

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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July 22, 2009 2:56:16 PM

Page 4

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Parent Item Name: Crosstube Low Standard Aft

Comments:

Start Date: 07/22/2009

Required Date: 07/31/2009

Start Qty: 1.00

Required Qty: 1.00

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Remaining Qty To Pick	Qty Issued	Date Issued	Status
AN960JD616		Purchased	No			260	Each	398.0000	18.0000			



Washer

Warehouse Loc Qty Loc Code

Location

Main Warehouse

ST 398

107242 3

107959 6

109371 8

110704 23

111193 18

111607 340

MS21042L6

Purchased

No

260

Each

779.0000

6.0000



Nut

Warehouse Loc Qty Loc Code

Location

Main Warehouse

ST 779

105077 22

110002 257

111548 100

111578 400

111607

59

110002

9/6/7 @ 10
59

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Shop Packet Print

Page 4

Dart Aerospace Ltd

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Parent Item Name: Crosstube Low Standard Aft

Comments:

Start Date: 07/22/2009

Required Date: 07/31/2009

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Required Qty: 1.00

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Remaining Qty To Pick	Qty Issued	Date Issued	Status
MS21920-28		Purchased	No			260 240 2	Each	150.0000	4.0000			
Clamp(per MIL-DTL-8783C)												

<u>Warehouse</u>	<u>Loc Qty</u>	<u>Loc Code</u>
<u>Location</u>		
OFFSHORE		
FG	5	
105884	5	
Main Warehouse		
ST	145	
106864	5	
108466	9	
108847	7	
109181	14	
109965	10	
111281	50	
111734	50	

mm mm 09 08 06

Dart Aerospace Ltd

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DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

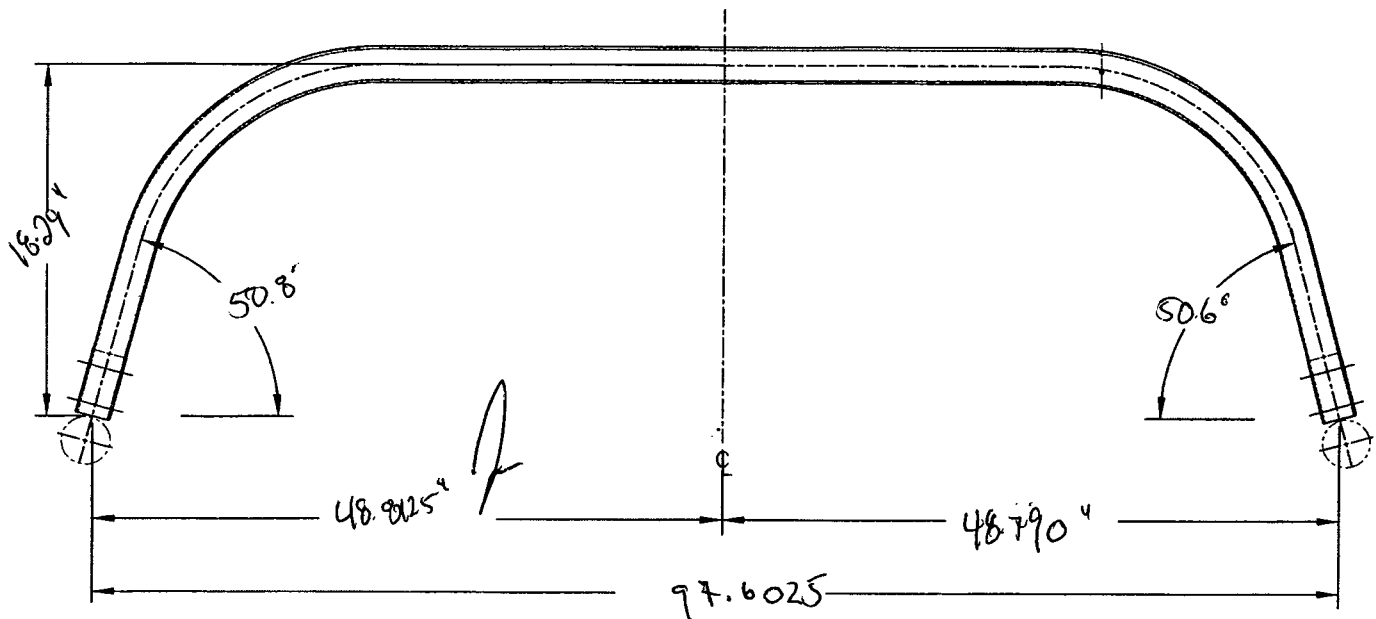
QA: N/C Closed: _____ Date: _____

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DART AEROSPACE LTD		Work Order:	50797
Description: Crosstube Low Aft (205/212)		Part Number:	D212-664-207
Inspection Dwg: D212-664-247 Rev: A		Page 1 of 1	

Required Dimension	Min	Max
Height	18.16	18.42
1/2 Span	48.55	48.81
Angle	49	52
Total Span	97.1	97.62



Comments

QC15 Inspection	S
Date	09/03/24

Rev	Date	Change	Revised by	Approved
A	08.02.29	New Issue	KJ/JM	

PARTS LIST:


Qty	Part Number	Description
X	D212-664-247	CROSSTUBE ASSEMBLY (205/212 LOW AFT)
1	D6008-132	CROSSTUBE
2	D2940-1	SUPPORT
4	D3595-063-530	RUBBER CUSHION
2	D3660-1	CUFF
4	MS21920-28	CLAMP (OR MS21920-30)
44	CR3212-4-06	RIVET (OR M7885/3-4-06)
A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)
A/R	SIKAFLEX-241/-291	SEALANT (OR PROSEAL 890 OR MIL-S-8802 CLASS B2 SEALANT)

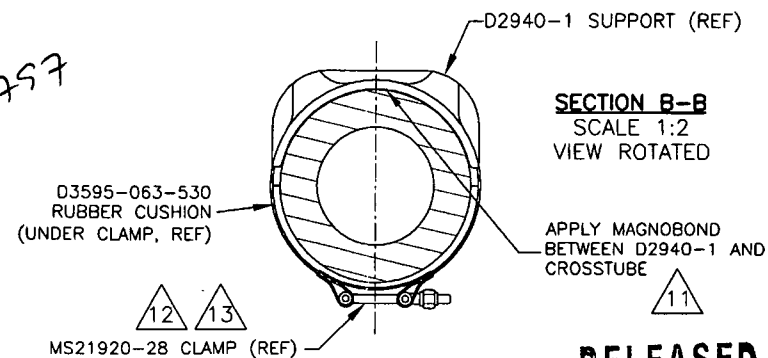
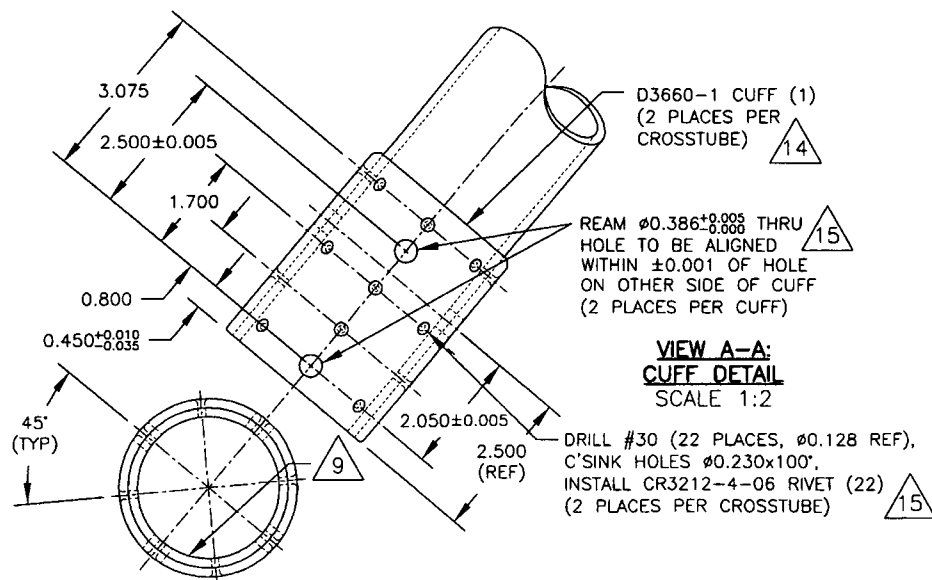
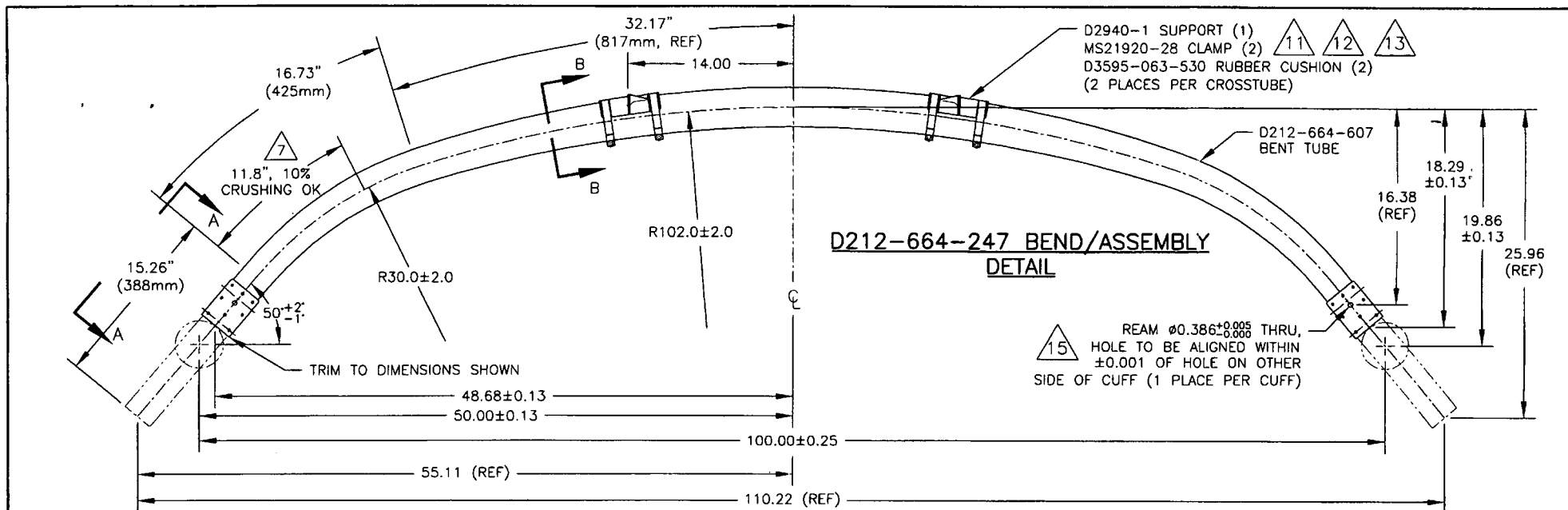
GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6008-132
FINISHED LENGTH = 128.27±0.020 (BEFORE BENDING/TRIMMING)
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) ALL DIMENSIONS ARE IN INCHES
- 5) PART IS SYMMETRIC ABOUT CENTERLINE.
- 6) WHEN MACHINING TAPER, RUN-OFF PART AT STOCK. BLEND OUT EDGE LONGITUDINALLY.
TRANSITION SHOULD BE SMOOTH.
- 7) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE
TO BENDING IS 6% BASED ON O.D., EXCEPT UP TO 10% IS ALLOWED IN AREA NOTED.
- 8) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 9) SCRIBE DART PART NUMBER AND BATCH NUMBER ON INNER SURFACE OF TUBE WITH A
VIBRATING STYLUS.
- 10) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE
OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS
SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT
LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 11) APPLY A 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2940-1
THAT WILL BE IN CONTACT WITH THE CROSSTUBE. LET CURE FOR 12 HOURS AFTER
INSTALLATION AND PRIOR TO PACKAGING.
- 12) INSTALL MS21920-28 CLAMPS (OR -30) WITH D3595-063-530 RUBBER CUSHIONS TO SECURE
D2940-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE
CROSSTUBE SUPPORT.
- 13) TORQUE CLAMPS 80 TO 100 IN.-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY
AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.
- 14) INSTALL D3660-1 CUFF AFTER CHEMICAL CONVERSION COAT BUT BEFORE PAINT, WITH A
LAYER OF SIKAFLEX-241/-291 OR PROSEAL 890 OR MIL-S-8802 CLASS B2 SEALANT BETWEEN
CUFF AND CROSSTUBE. SEAL EDGE OF CUFF TO ENSURE NO GAPS.
- 15) TOUCH-UP HOLES WITH CHEMICAL CONVERSION COAT.

#50797
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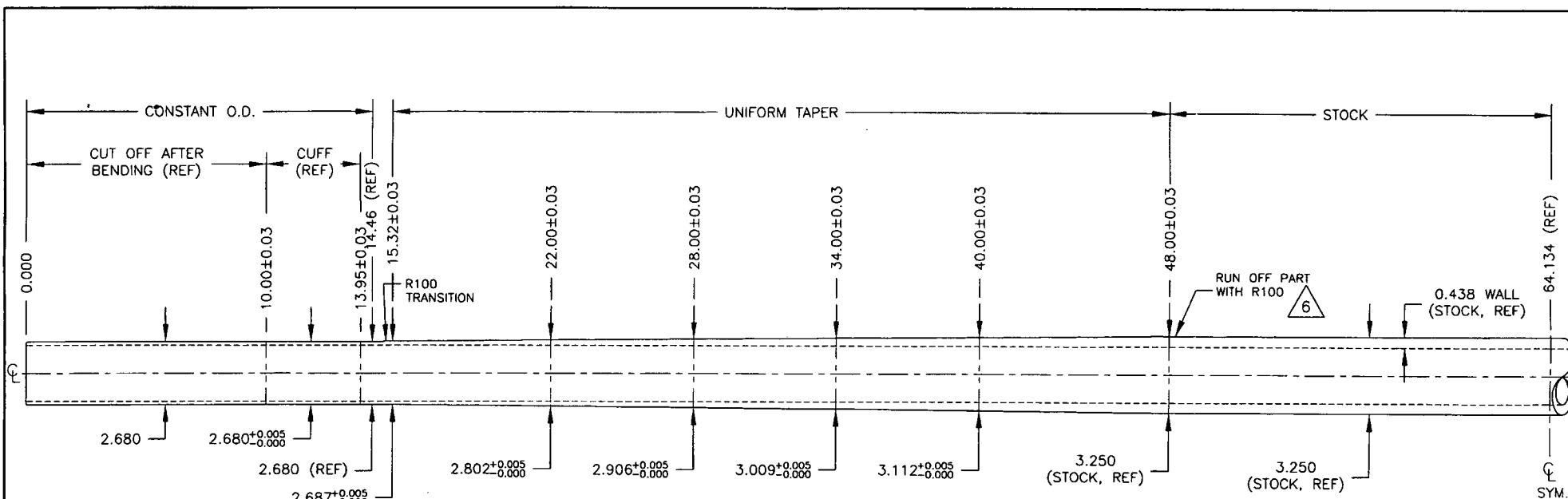
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A		07.07.07	NEW ISSUE
DESIGN	gp	DRAWN BY	gp
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DATE	07.07.07	D212-664-247	SHEET 1 OF 3
		TITLE	SCALE
		CROSSTUBE (205/212 LOW AFT)	NTS



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		DATE 07.07.07	TITLE CROSSTUBE (205/212 LOW AFT)		SCALE 1:8



D212-664-247 MACHINING DETAIL

W/0 50797

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		DATE 07.07.07	DRAWING NO. D212-664-247	REV. A SHEET 3 OF 3	
			TITLE CROSSTUBE (205/212 LOW AFT)	SCALE 1:4	

DRAWING NO. D212-664-247	TITLE CROSSTUBE	REV. A	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D212-664-247-A-1	SHEET NO. SHEET 1 OF 1	SCALE NTS
DRAWN UP	CHECKED RJ	MFG. APPR. AJ	APPROVED AND		DE APPR. H		
DATE 09.05.01	DATE 09.06.15	DATE 09/06/22	DATE 09/06/22		DATE 09.06.22		

CHANGE:

ADD THE FOLLOWING CROSSTUBE ASSEMBLY:

Part Number	Description
D212-664-247B	CROSSTUBE ASSEMBLY (214 LOW AFT)

THE D212-664-247B CROSSTUBE HAS THE SAME PARTS LIST AS THE D212-664-247 CROSSTUBE. HOWEVER, INSTALL THE SUPPORTS AS SHOWN IN FIGURE 1 OF THIS ENGINEERING ORDER. THE NEW KIT IS OTHERWISE ASSEMBLED PER THE D212-664-247 CROSSTUBE.

RELEASED
09/06/22

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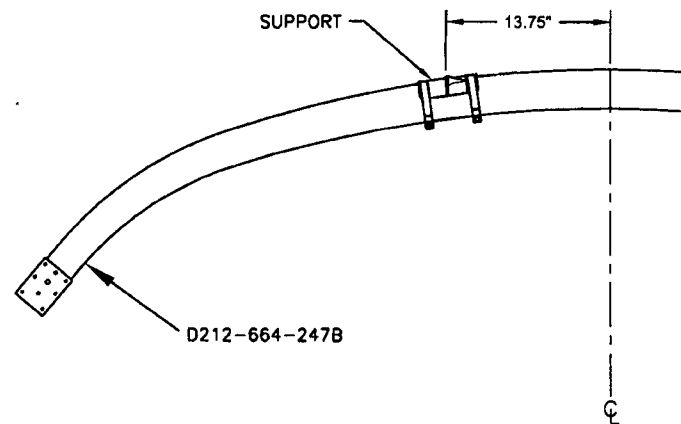


FIGURE 1 - SUPPORT INSTALLATION

Jason Murdoch

From: David Shepherd [dshepherd@dartaero.com]
Sent: July 28, 2009 6:25 PM
To: 'Mike Petsche'
Cc: 'Eric Charbonneau'; 'Bill Beckett'; 'Jean-Luc Menard'; 'Jason Murdoch'; 'L Lacelle'; ssheldon@dartaero.com
Subject: RE: low crosstubes
Attachments: 20090728154900265.pdf; cuff 002.jpg; Drawing-July 27-09.pdf

Mike,

Sorry for not getting back to you right away on this. Eric has provided me with some interesting measurements and photographs in the last couple of days.

Based on the attached modified analysis, it is acceptable to grind down the crosstubes to a minimum wall thickness of 0.120" so that the existing cuffs will fit. The cuff is already 0.010" to 0.020" bigger than the end of the crosstube, so I would prefer not to enlarge the cuff parts as this will just increase the gaps in the inboard/outboard directions. See attached. I am OK with your proposal to update the IPP/estimate/routing with a statement like "Grind ends of crosstube to min wall thickness of 0.120" so that cuffs will fit" rather than updating the drawing. I am hoping that this is only a temporary solution.

Ultimately, at the risk of stating the obvious, we need to find a way to keep the cuffs rounder off the bender. My understanding is that this problem is exaggerated on the newer bender because the shafts are bigger and there is more crosstube stuffed in the bender. Could we go back to bending these on the old bender on the narrowest possible setting? Or at least finish them on the old bender? My guess is that this problem will be even worse when we try to bend the 412CF crosstubes, yet we delivered 16 sets of 412CF low narrow gear to Canadian that I believe were bent on the old machine?

As I said this morning, I would be prepared to work with Dan on his bending programs when I am there in mid August. I know these are tricky to bend, but it sounds to me like his bend is travelling into the cuff more than it should be.

Bill/Susanne,

I'm a little concerned that we would bend and grind 0.030" of material off 5 tubes before it was reported that this was a problem, but I don't know the full story.

David

From: Mike Petsche [mailto:mpetsche@dartaero.com]
Sent: Tuesday, July 28, 2009 8:47 AM
To: 'David Shepherd'
Cc: 'Bill Beckett'; echarbonneau@dartaero.com; 'Jean-Luc Menard'; 'Jason Murdoch'
Subject: low crosstubes

David,

As I'm getting back up to speed here, it would seem that grinding the ends of the crosstubes at least for now, seems to be the best option to make the sleeves fit.

Eric has said that you are comfortable with the amount being removed. So that being the case, we need an excuse me note for them to continue doing what they are doing. (which needs to come from

29/07/2009

Chris or you).

I think we COULD get away with just adding this to the IPP....otherwise we could do a DEO to the crosstube dwg...

Mike Petsche

Design Manager

DART Aerospace

phone: 613-632-5200

mobile: 514-833-1657

skype: mike.petsche

No virus found in this incoming message.

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Version: 8.5.392 / Virus Database: 270.13.34/2268 - Release Date: 07/28/09 06:00:00



LIQUID PENETRANT TEST REPORT

P- 14944

CLIENT	DART AEROSPACE	DATE	Aug 4-2009	PAGE	1	OF	1	
ATTENTION	LINDA / CHANTEL	ACUREN JOB NO.	188-09-001480	TIME	AM	<input checked="" type="checkbox"/>	PM	<input type="checkbox"/>
ADDRESS	1270 ABERDEEN ST HAWKESBURY ON. K6H 1K7	PO/NO.	10169	WORK LOCATION	HAWKESBURY			
PROJECT	F.P.I. ON MACHINED PARTS AND CROSS TUBES	ACCEPTANCE STD.	ASTM 1417	REV./DATE	2007			
ITEM(S) EXAMINED								

JOB DESCRIPTION	PROCEDURE NO. LT-0002	REV./DATE	TECHNIQUE NO. LT-0002	REV./DATE
PART NO.	MATERIAL S.S. / ALUMINUM THICKNESS			
SCOPE	WET FLUORESCENT LIQUID PENETRANT INSPECTION CARRIED OUT 100% EXTERNAL			

TEST DETAILS	
METHOD <input checked="" type="checkbox"/> FLUORESCENT <input type="checkbox"/> VISIBLE	<input type="checkbox"/> WATER WASH <input type="checkbox"/> SOLVENT REMOVABLE <input type="checkbox"/> POST EMULSIFIED
FAMILY BRAND MAGNAFLUX	BLACK LIGHT S/N 16459 <input type="checkbox"/> OUTPUT > 1000 μ W/cm ² <input type="checkbox"/> AMBIENT < 2 fc
PENETRANT ZL 67 MINIMUM DWELL TIME 45 MIN.	LIGHTING EQUIP. <input type="checkbox"/> FLASHLIGHT <input type="checkbox"/> TROUBLELIGHT <input type="checkbox"/> OUTPUT > 100 fc @ SURFACE
PENETRANT REMOVER H2O MINIMUM DRY TIME > 10 MIN.	OTHER LABINO
DEVELOPER SKD 52 MINIMUM DWELL TIME 10 MIN.	LIGHT METER S/N
DEVELOPER TYPE <input checked="" type="checkbox"/> NON AQUEOUS <input type="checkbox"/> AQUEOUS <input type="checkbox"/> DRY	CAL DUE DATE DEC. 8-2009

TEST SURFACE	
SURFACE CONDITION <input type="checkbox"/> AS GROUND <input checked="" type="checkbox"/> AS WELDED <input type="checkbox"/> MACHINED <input type="checkbox"/> SHOT BLASTED <input checked="" type="checkbox"/> CLEAN BARE METAL	
SURFACE TEMPERATURE <input type="checkbox"/> < -4°C/ 20°F <input type="checkbox"/> -4°C/ 20°F TO 10°C/ 50°F <input type="checkbox"/> 10°C/ 50°F TO 52°C/ 125°F <input type="checkbox"/> > 52°C/ 125°F	

RESULTS- (<input type="checkbox"/> METRIC <input type="checkbox"/> IMPERIAL)	
W.O. 50388 40 MACHINED PARTS	✓
W.O. 50965 10 PCS	
W.O. 50966 10 PCS	✓
W.O. - 50796 - 1 PC	✓
W.O. - 50798 - 1 PC	✓
W.O. - 50797 - 1 PC	✓
W.O. - 50667 - 1 PC	✓
ALL ITEMS INSPECTED WERE FOUND ACCEPTABLE MM 09 08 05	

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Standard of Care
In performing the services provided, Acuren Group Inc. uses the degree, care and skill ordinarily exercised under similar circumstances by others performing such services in the same or similar locality. No other warranty, expressed or implied, is made or intended by Acuren Group Inc.

SIGNATURES		DTR # E-20066	
CLIENT REPRESENTATIVE	MATTHEW MURDOCH	REPORT REVIEWED BY:	
TECHNICIAN (SIGNATURE):	Mike Johnston	NAME	INITIALS
NAME (PRINT):			
CGSB LEVEL	II	CGSB LEVEL	
CGSB REG. NO.	6066	CGSB REG. NO.	